

General

Guideline Title

Ottawa Panel evidence-based clinical practice guidelines for aerobic walking programs in the management of osteoarthritis.

Bibliographic Source(s)

Loew L, Brosseau L, Wells GA, Tugwell P, Kenny GP, Reid R, Maetzel A, Huijbregts M, McCullough C, De Angelis G, Coyle D, Ottawa Panel. Ottawa panel evidence-based clinical practice guidelines for aerobic walking programs in the management of osteoarthritis. Arch Phys Med Rehabil. 2012 Jul;93(7):1269-85. [111 references] [PubMed](#)

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Recommendations

Major Recommendations

Definitions for the level (Level I, Level II) and strength (2 points, 1 point) of evidence ratings and the grade of the recommendations (A, B, C+, C, D, D+, D-) are presented at the end of the "Major Recommendations" field.

1. Evidence-Based Clinical Practice Guidelines (EBCPGs) related to a walking program alone vs control (normal daily activities), Level II (1 controlled clinical trial [CCT], N=81, low quality [1,0,0]): Grade B for physical function (Western Ontario and McMaster Universities Osteoarthritis Index [WOMAC] physical function at 3-mo follow-up [FU]), pain relief (Nottingham Health Profile [NHP] pain and WOMAC pain at 3-mo FU), and quality of life (NHP energy, physical mobility, and sleep at 3-mo FU) (clinically important benefit). Patients with a diagnosis of osteoarthritis (OA) of the knee met the only inclusion criteria.
2. EBCPGs related to a walking program with strengthening training vs control (patient education), Level I (2 randomized controlled trials [RCTs], n=374, high quality [2,0,1]): Grade A for quality of life (Arthritis Impact Measurement Scales [AIMS] mobility, walking and bending, and arthritis pain at end of treatment at 12 wk) and functional status (incidence of disability on activities of daily living [ADLs]) (clinically important benefit); Grade C+ for quality of life (AIMS 2nd version [AIMS2] work, hand, and finger function, arm function, self-care tasks, and AIMS2 household tasks at end of treatment at 12 wk) (clinically important benefit demonstrated without statistical significance); Grade C for flexibility (hamstrings and low back flexion at end of treatment at 12 wk), torque (quadriceps isometric torque [QIT] at 60° for the most and least affected leg, hamstrings isometric torque [HIT] at 60° for the most and least affected leg, hamstrings isokinetic torque [HIKT] at 30°/s for the most and least affected leg at end of treatment at 12 wk), quality of life (AIMS2 social activity, support from friends, level of tension, and mood at the end of 12 wk of treatment) (no benefit), and functional status (disability in transferring from bed to chair, bathing, and eating); Grade D for endurance (5-minute walk test at end of treatment at 12 wk) and quality of life

- (disability in toileting and in dressing at 18-mo FU) (no benefit demonstrated but favoring control); and Grade D+ for functional status (incidence of disability on ADLs, transferring from bed to chair, and bathing at 18-mo FU) (clinically important benefit demonstrated favoring control). Patients who met the following criteria: (1) were aged ≥ 60 ; (2) had pain in the knee(s) on most days of the month; (3) had difficulty with at least 1 of the following because of knee pain: walking 0.4 km; climbing stairs; getting in and out of a car, bath, or bed; rising from a chair; or performing shopping, cleaning, or self-care activities; and (4) showed radiographic evidence of knee OA.
3. EBCPGs related to a walking program with health education and behavioral components vs control (normal daily activities), Level I (3 RCTs, $n=126$, high quality [2,0,1]): Grade A for pain relief (AIMS pain at end of treatment at 8 wk), endurance (6-minute walk test at end of treatment at 8 wk), quality of life (AIMS physical activity at end of treatment at 8 wk), and AIMS pain and AIMS medication use at end of treatment at 8 wk (clinically important benefit); Grade C+ for pain relief (McGill Pain Questionnaire present pain intensity at 12-wk FU), AIMS arthritis impact at end of treatment at 8 wk, mobility (steps per day, timed stair climb at end of treatment at 12 wk), and torque (right knee extensor isometric peak torque at 120° at end of treatment at 12 wk, left knee extensor isometric peak torque at 140°, right knee extensor isometric peak torque at 140° at end of treatment at 12 wk) (clinically important benefit demonstrated without statistical significance); and Grade C for pain relief (McGill Pain Questionnaire pain rating index total [0–45] at end of treatment at 12 wk), mobility (timed chair rise, 100-foot timed turn walk usual speed, and 100-foot timed walk-turn-walk fast pace at end of treatment at 12 wk), mobility (free walking speed and fast walking speed at end of treatment at 8 wk), quality of life (AIMS arthritis impact at end of treatment at 8 wk, AIMS pain at end of treatment at 12 wk and 9-mo FU), and torque (left knee extensor isometric peak torque at 120° at end of treatment at 12 wk and 3-mo FU, left knee extensor isometric peak torque at 140° at 3-mo FU) (no benefit). Patients who were ≥ 40 y old; had a documented diagnosis of chronic, stable, primary OA of 1 or both knee joints in association with at least 4-mo history of symptomatic knee pain occurring during weight-bearing activities (patients with multiple joint involvement, those who had undergone major joint surgery, or had a lower joint prosthesis were also eligible); who had radiographic evidence of primary OA of 1 or both knee joints, as demonstrated by joint space narrowing, marginal spur formation, or subchondral cyst formation; who used any of the various common, over-the-counter non-steroidal anti-inflammatory drug (NSAIDs) ≥ 2 d/wk; and who were not participating in a regular program of physical activity at the time of enrollment.
 4. EBCPGs related to a walking program with multicomponent exercises vs control (patient education), Level I (2 RCTs, $n=186$, 1 low quality [2,0,0] and 1 high quality [2,0,1]): Grade A for pain relief (pain intensity in transfer at 3 mo, 9 mo, end of treatment 18 mo, and pain frequency in transfer at 3 mo) and quality of life (AIMS physical activity at end of treatment at 12 wk) (clinically important benefit); Grade C+ for pain relief (pain intensity ambulation and pain frequency in ambulation at 3 mo, pain frequency in transfer at 9 mo), quality of life (AIMS physical activity at 9-mo FU), and stiffness (morning stiffness at end of treatment at 12 wk) (clinically important benefit demonstrated without statistical significance); Grade C for pain relief (pain intensity ambulation and pain frequency in ambulation at 9 mo and end of treatment at 18 mo, pain frequency in transfer at end of treatment at 18 mo), pain relief (AIMS pain at end of treatment at 12 wk), mobility (walking speed at 3 mo, 9 mo, and end of treatment at 18 mo), mobility (50-foot walking time at end of treatment at 12 wk and at 9-mo FU), endurance (exercise endurance at end of treatment at 12 wk), stiffness (morning stiffness at end of treatment at 12 wk), and force (grip force at end of treatment at 12 wk and 9-mo FU) (no benefit); Grade D for flexibility (trunk flexibility at end of treatment at 12 wk), endurance (exercise endurance at 9-mo FU), and cardiopulmonary function (maximum oxygen consumption at 9-mo FU) (no benefit demonstrated but favoring control); and Grade D+ for flexibility (trunk flexibility at 9-mo FU), pain relief (AIMS pain at 9-mo FU), and cardiopulmonary function (maximum oxygen consumption at 12 wk) (clinically important benefit demonstrated favoring control). Patients who met the following criteria: (1) were ≥ 60 y old, (2) had pain on most days of the month in 1 or both knees, (3) showed radiographic evidence of knee OA in the tibial-femoral compartments of the painful knee, and (4) had difficulty with at least 1 of the following activities because of knee pain—walking 0.4 km, climbing stairs, getting in and out of a car, rising from a chair, lifting and carrying groceries, getting out of bed, getting out of a bathtub, shopping, cleaning, or self-care.
 5. EBCPGs related to a walking program with multicomponent exercises and health education vs control (health education), Level I (1 RCT, $N=77$, 1 low quality [1,0,0] and 1 high quality [2,0,1]): Grade A for functional status (Health Assessment Questionnaire at end of treatment at 3 mo and at 3-mo FU), functional status (Lequesne index [LI] at end of treatment at 3 mo and at 3-mo FU), and quality of life (Medical Outcomes Study 36-Item Short-Form Health Survey [SF-36] functional capacity, SF-36 physical role limitation, SF-36 bodily pain at end of treatment at 3 mo and at 3-mo FU, and SF-36 general health at 3-mo FU) (clinically important benefit); Grade C+ for pain relief of past week (0–10 visual analog scale at end of treatment at 12 wk) (clinically important benefit demonstrated without statistical significance); Grade C for quality of life (SF-36 vitality at 3-mo FU), quality of life (SF-36 general health at end of treatment at 3 mo) (no benefit); and Grade D for quality of life (SF-36 vitality at end of treatment at 3 mo) and quality of life (AIMS total at end of treatment at 12 wk) (no benefit demonstrated but favoring control). Patients who met the following criteria: American College of Rheumatology (ACR) clinical and radiographic criteria for primary OA of the knee; were ≥ 58 y old and living independently, without physical or medical problems for which exercise program would be contraindicated; were not currently enrolled in a regular exercise program; had not received intraarticular or systematic steroids within the past 2 y; and did not routinely use NSAIDs.

Definitions:

Level of Evidence

Level I: Randomized controlled trials

Level II: Nonrandomized studies

Strength of Evidence

2 points: for randomization method

2 points: for double-blinding

1 point: for description of drop-outs

Grading for Recommendations

Grade	Clinical Importance (%)	Statistical Significance (<i>P</i>)	Study Design
A (strongly recommended)	≥15	<.05	Randomized controlled trial (RCT) (single or meta-analysis)
B (recommended)	≥15	<.05	Controlled clinical trial (CCT) or observational (single or meta-analysis)
C+ (suggested used)	≥15	Not significant	RCT/CCT or observational (single or meta-analysis)
C (neutral)	<15	Not significant	Any study design
D (neutral)	<15 (favors control)	Not significant	Any study design
D+ (suggested no use)	<15 (favors control)	Not significant	RCT/CCT or observational (single or meta-analysis)
D- (strongly not recommended)	≥15 (favors control)	<.05 (favors control)	Well-designed RCT with >100 patients (if <100 patients, becomes Grade D)

Note: Combined Grading Recommendations according to the Ottawa Panel for alphabetical grading system and the Cochrane Collaboration (www.cochrane.org) for international nominal grading system.

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Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Osteoarthritis (OA) of the knee

Guideline Category

Management

Rehabilitation

Clinical Specialty

Family Practice

Geriatrics

Physical Medicine and Rehabilitation

Rheumatology

Intended Users

Advanced Practice Nurses

Health Care Providers

Physical Therapists

Physician Assistants

Physicians

Guideline Objective(s)

To update the Evidence-Based Clinical Practice Guidelines (EBCPGs) on aerobic walking programs for the management of osteoarthritis (OA) of the knee

Target Population

Adults 40 years old and older who were diagnosed with osteoarthritis (OA) of the knee

Interventions and Practices Considered

Aerobic walking programs with or without:

- Strengthening training
- Health education
- Behavioral components
- Multicomponent exercises

Major Outcomes Considered

- Pain level
- Quality of life
- Functional status

Methodology

Methods Used to Collect/Select the Evidence

Description of Methods Used to Collect/Select the Evidence

Eligibility Criteria

To accomplish systematic literature reviews, a list of eligibility criteria was developed by the Ottawa Methods Group, who decided to follow the population, intervention, comparator, outcomes, period of time, and study design (PICOPS) strategy, in order to ensure inclusion of relevant studies. Therefore, the inclusion and exclusion criteria include the characteristics of the population, intervention, comparator, outcomes, the period of time an intervention becomes effective, and the study design (see Table 2 in the original guideline document). Only articles written in English or French, from 1966 until February 2011, were selected.

Type of Participants

Studies were chosen if the comparison groups were composed of participants aged over 40 years who were diagnosed with OA of the knee, as defined by Klippel et al. For the inclusion of participants, the studies were required to follow the Kellgren-Lawrence grading scale, according to the radiologic and/or clinical assessment of OA. The patients had to show no signs of psychiatric conditions, demonstrate stable physical and medical status, and have a healthy weight (body mass index [BMI] <25 kg/m²). Mixed populations were permitted only if they consisted of patients with OA or rheumatoid arthritis, where the patients with OA were the majority. For the complete list of exclusion criteria and the PICOPS process please refer to Table 2 in the original guideline document.

Risk of Bias across Studies

Studies that were described only in an abstract, where authors could not be contacted for further details, were automatically excluded because they did not provide enough results for the data analysis. Time and translation costs were limited, therefore only English and French studies were selected (see Table 2 in the original guideline document).

Information Sources

The library scientist (J.M.) performed a systematic search of the literature using a search strategy proposed by the Cochrane Collaboration. The main focus of the search was to identify the methodology and study design determined by primary studies, rather than identifying outcomes. In other words, the library scientist based her search on relevant topics, by including OA terms, physical therapy terms (e.g., walking), and study design terms. The systematic approach, which consisted of an organized method for the selection of articles, data extraction, and synthesis analyses decreased the possibility of presenting bias. See Appendix 2 in the original guideline document for more details on how the literature search was completed.

The search was conducted using the electronic databases EMBASE, PubMed, CINAHL, PEDro, SCOPUS, BioMed, SUMsearch, and Cochrane Library and also included case-control, cohort, and nonrandomized studies up until February 2011.

Data Collection Process

Study Selection/Data Items

After a systematic search of the literature, a pair of reviewers evaluated the studies. Referring to the inclusion and exclusion criteria (see Table 2 in the original guideline document), the reviewers created a list of the included and excluded articles. The reviewers referred to the principal assessor when uncertainty was present.

Number of Source Documents

The literature search found 719 potential records, and 10 full-text articles were included according to the selection criteria. The Ottawa Panel developed recommendations based on 7 out of 10 comparative controlled studies with higher quality.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Level of Evidence

Level I: Randomized controlled trials

Level II: Nonrandomized studies

Strength of Evidence

2 points: for randomization method

2 points: for double-blinding

1 point: for description of drop-outs

Methods Used to Analyze the Evidence

Meta-Analysis of Randomized Controlled Trials

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The Ottawa Methods Group read and analyzed the articles and organized several evidence tables. The Ottawa Panel experts later reviewed the work to attain a consensus.

Data Extraction

The reviewers independently extracted important information from each included study using standardized data extraction forms. This included the characteristics of participants, treatment, study design, allocation concealment, comparative results, and period of data collection.

Methodologic Quality Assessment/Risk of Bias in Individual Studies

The Jadad scale was used to assess the methodologic quality of each study selected. Each study was awarded a maximum of 5 points: 2 points for the randomization method, 2 points for double-blinding, and 1 point for a description of the dropouts. The reviewers referred to the principal assessor when differences were noticed in data extraction and Jadad scale scoring. A study assessed at a Jadad scale score of 3 or more points is typically considered as having high methodologic quality. The Ottawa Panel accepted the inclusion of studies with a Jadad scale score of less than 3 points. Points for double-blindness were rarely given because of the nature and difficulties of blinding therapists or participants during physical therapy treatments. Consequently, more importance was given to the 2 other categories of the Jadad scale, which are randomization and withdrawals (see Appendix 3 in the original guideline document). Articles were excluded if they did not meet the selected inclusion criteria according to the Ottawa Panel (see Table 2 in the original guideline document).

Data Analysis/Summary Measures

The Cochrane Collaboration methods were used to perform statistical analysis (www.cochrane.org). Weighted mean differences between the experimental and control groups were calculated for continuous data, allowing for the calculation of the mean and standard deviation (SD) corresponding to the sample size of each group. According to the Cochrane Collaboration, for each specific outcome, weighted mean differences were indicated by a square and the SD of the weighted mean difference was illustrated by a horizontal line. As long as the horizontal line reached the central vertical axis, the weighted mean difference between the 2 comparative groups was not statistically different because the confidence interval included zero (see Figure 1A at 9 mo in the original guideline document). By subtracting the improvement of the experimental group with the improvement in the control group, it is possible to calculate the absolute benefit. The relative difference can be found by dividing the absolute benefit out of the baseline mean (weighted for the treatment and control groups). Selected by the Philadelphia Panel and adopted by the rheumatology and biostatistician experts of the Ottawa Panel, an improvement of 15% relative to a control group contributes to the achievement of clinical improvement. For dichotomous variables, the clinical improvement is calculated as the difference between the percent improved among the experimental and control groups. For more details about the statistical analysis, see the previous publications of the Ottawa Panel. According to the Cochrane Collaboration, the standardized mean difference is used as a summary statistic, which represents the recommended effect size when studies select the same outcome but are measured with a different scale in the meta-analysis. The goal of calculating

this value is to standardize and combine the results of the studies to a uniform statistic for pooling and comparison purposes (see Figures 1B and 1C in the original guideline document). The individual results for each randomized controlled trial (RCT) are shown in Figures 1B and 1C in the original guideline document. The global effect of the pooled results of Figures 1B and C is indicated in the Results section of the original guideline document.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The Ottawa Methods Group read and analyzed the articles and organized several evidence tables. The Ottawa Panel experts later reviewed the work to attain a consensus.

Rating Scheme for the Strength of the Recommendations

Grading for Recommendations

Grade	Clinical Importance (%)	Statistical Significance (<i>P</i>)	Study Design
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Cost Analysis

The guideline developers reviewed published cost analyses.

Method of Guideline Validation

Not stated

Description of Method of Guideline Validation

Not applicable

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

- Appropriate implementation of aerobic walking programs in the management of osteoarthritis (OA)
- An aerobic walking program helps relieve pain and promote remodeling without increasing stress in the affected joint.

Potential Harms

High-intensity activities are considered risk factors for injury and relapse; therefore, an individual with osteoarthritis (OA) should always maintain intensity at a safe level.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

Staying Healthy

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

Loew L, Brosseau L, Wells GA, Tugwell P, Kenny GP, Reid R, Maetzel A, Huijbregts M, McCullough C, De Angelis G, Coyle D, Ottawa Panel. Ottawa panel evidence-based clinical practice guidelines for aerobic walking programs in the management of osteoarthritis. Arch Phys Med Rehabil. 2012 Jul;93(7):1269-85. [111 references] [PubMed](#)

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2012 Jul

Guideline Developer(s)

Ottawa Panel - Independent Expert Panel

Source(s) of Funding

Supported by the Canadian Institute of Health Research, The Arthritis Society, the Ontario Ministry of Health and Long-Term Care (Canada), The University of Ottawa, Faculty of Health Sciences, and the Ministry of Human Resources, Summer Students Program (Canada).

Guideline Committee

Ottawa Panel Evidence-Based Clinical Practice Guidelines Development Group

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Financial Disclosures/Conflicts of Interest

No commercial party having a direct financial interest in the results of the research supporting this article has or will confer a benefit on the authors or on any organization with which the authors are associated.

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Electronic copies: Available from the [Archives of Physical Medicine and Rehabilitation Web site](#) .

Availability of Companion Documents

None available

Patient Resources

None available

NGC Status

This summary was completed by ECRI Institute on September 27, 2013.

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